Daily GLOWBUGS

Digest: V1 #40

via AB4EL Web Digests @ SunSITE

Purpose: building and operating vacuum tube-based QRP rigs

AB4EL Ham Radio Homepage @ SunSITE

%%%%% GlowBugs %%%%% GlowBugs %%%%% GlowBugs %%%%% GlowBugs %%%%%

Subject: glowbugs V1 #40
glowbugs Friday, May 23 1997 Volume 01 : Number 040

Date: Thu, 22 May 1997 13:08:48 -0400 (EDT)
From: EWoodman@aol.com
Subject: Re: Playing with a modern spark tuner --- suprising funzies

>> I also found
>> that a small capacitor across the detector improved the volume by a noticable
>> amount.

>This is interesting. I have never seen that trick. Perhaps I will have
>to go back and try it tonight. I dunno what this could be doing, unless
>it is giving a measure of negative resistance to overcome losses in the
>crystal by feeding some AC voltage over to the headphones (a few percent).

Don't recall the exact reasoning behind this. Wish I had the article at the office here. I'll dig it out tonight and let you know what it says. I was surprised that I never saw this mentioned anywhere else before.

>My own agenda for doing this xtal bit was to use it as the basis for
>a recreation of the 1916 SE 143 spark tuner, with an outboard xtal or
>audion box (mebbie a globular '00 of some sort or a '99 for periodicity).

After reading your copies of the regen manuals that's what I was thinking too. I'd love to have one of those. Just don't have the original parts. I'm also a bit stuck on how to handle the variable coupling part. I'd like the front panel to at least look similar with the same type of controls. Guess as long as it had the same "look and feel" I'd be happy.

As for your description of the heterodyne crystal receiver.....just sounds like what they call a direct conversion reciever these days! I just need to couple an oscillator with the correct freq offset to give me some audio tone.

>>also says that mica diaphragm phones are the best for sensitivity. Have you

>> ever seen or heard of these? I'm guessing if any still exist they must be
>> pretty scarce!

>Oy, Oy, Oy, yes.... these be the fabled, and legendary ``Baldies'', or
>Baldwin ``Micas'', or Baldwin Type C Receivers.
>It is reputed
>that they are sufficiently sensitive to add the equivalent of an extra
>stage of audio amplification to a detector set.

Wow, wish I could get my hands on a pair of those! I have two sets of Trimms
but don't know how they rate, sensitivity-wise, with any others as I have
nothing to compare them to.

Eric KA1YRV

Date: Thu, 22 May 1997 13:19:52 -0400 (EDT)
From: rdkeys@csemail.cropsci.ncsu.edu
Subject: Heterodyne receiver tricks - continued

One more way to get a very stable receiver, from a lowly regenerator,
is to wrap the line from a BC-221 or LM freq meter binding posts with
a foot of wire or so, two or three times around the grid lead of the
detector. Back when I was a novice and noone told me you could not
do it that way I used to copy rtty on a model 19 with a 1 tube TU using
the LM to feed the heterodyne into the RAL. It worked fine on locals,
as long as the QRM/QRN was not too bad. It works very well on CW.
You have to adjust the signal injection voltage (using the rf output
pot on the LM) until the best signal is obtained through the detector.
That scheme will work with anything from a xtal set to a modernethingie.
Once the LM settles down, it is quite comfy in stability. If I want
absolutely rock stable armchair copy on a wx run from WCC, it still
works fine! Move over kenicoyasawhooies (that be them thar late model
thingies wat don't glow no more)!

Bob/NA4G

Date: Thu, 22 May 1997 13:57:44 -0400 (EDT)
From: rdkeys@csemail.cropsci.ncsu.edu
Subject: Re: Playing with a modern spark tuner --- suprising funzies

>
> >> I also found
> >> that a small capacitor across the detector improved the volume by a
> noticable
> >> amount.

Do see if you can find the info on that capacitor across the xtal bit.

> >My own agenda for doing this xtal bit was to use it as the basis for
> >a recreation of the 1916 SE 143 spark tuner, with an outboard xtal or
> >audion box (mebbie a globular '00 of some sort or a '99 for periodicity).
>
> After reading your copies of the regen manuals that's what I was thinking

> too. I'd love to have one of those. Just don't have the original parts. I'm
> also a bit stuck on how to handle the variable coupling part. I'd like the
> front panel to at least look similar with the same type of controls. Guess
> as long as it had the same "look and feel" I'd be happy.

Well, that is about all I can afford is the lookiefeelie type of thing.
But, after years of scrounging parts, I can probably make up something
close enough the the unknowing eye, that it would look a bit like a picture
out of a book.

The panel on the SE 143/SE 1220 is the most comfy of the lot to look at
in terms of ergonomics and that kind of thing. The SE 1420 and IP-501-A
are the epitomes of the basic regen philosophy for simple circuits.
But, the layout has shrunk the dials down to make them smaller physically
in a smaller receiver box. I have a yen for that ``massive'' receiver
look, that will stay put in a hurricane or a tornado. I like knobs I
can get me bigge hands on easily. The sizes of the parts in these things
are also large enough that a junk box constructor will have no problems
making them, and things like the hardware can be bent from this and that
fairly easily. Alas, those big 8 inch German Silver dials will be a bit
hard to reproduce. Some of the later models had ivory plastic celluloid
dials almost like a Hammarlund dial, that would not be too bad to make.

The variometers and coils are not much problem on the, because they are
so big, that you can easily make them out of plumbing black pvc pipe and
they look fine. I fancy yellow covered wire, for contrast, and good old
yellow bell wire makes a good approximation for 75-750 meters use.
Making the variometers is not great trouble, unless you want fancy bearings.
Stripping old burned out potentiometers of their shafts and bearings will
do nicely for that (if you need good panel bearings those burned out
pots work great, as do 1/4 inch phone jacks if you strip away the excess).
A brass shaft does nicely. Mount with a wooden block or plastic/phenolic
bracket made from a knob with a setscrew to hold it to the shaft. A doodle
of superglue holds it all together.

At hamfests, keep a sharp eye out for loose variometer balls, folks have
removed from forms, in the bilges of junk boxes. They can be easily
remounted on a shaft and reused in your own coils.

Switch points are not necessary, since they were usually behind the panel.
One can make up nice repro behind the panel switches from brass bolts,
washers and nuts, if one can come up with some sort of shaft and contact
arm (again the knob/shaft/recycled bearings can help).

Some early receivers, typified by the American Marconi 101 receiver and I
think the 103 also, used a dial wire with one of the primary/secondary
coils hung on the wire and one fixed, and the dial moved the coil/wire
over rollers. As long as it was relatively stable, that would do for the
lower bands. Above 80M, any wobbling would make tuning difficult.
The American Marconi 106 series receivers overcame that with a gear and
track assembly that had rigid parts. The SE and IP series receivers
just used traditional variometer couplers.

> As for your description of the heterodyne crystal
> receiver.....just sounds like what they call a direct conversion
> reciever these days! I just need to couple an oscillator with the correct
> freq offset to give me some audio tone.

Hee, hee..... Yes, them latemodel hams wat never did read their radio

history and thought they were inventing a new toy, were actually reinventing
the heterodyne receiver from 60 years earlier (1907). Nuttin' new under
that radio sun...... I guess they figured transistors and IC's made the
thing a totally new toy. Ain't history fun.....

> >>also says that mica diaphragm phones are the best for sensitivity. Have you
> >> ever seen or heard of these? I'm guessing if any still exist they must be
> >> pretty scarce!
>
> >Oy, Oy, Oy, yes.... these be the fabled, and legendary ``Baldies'', or
> >Baldwin ``Micas'', or Baldwin Type C Receivers.
> >It is reputed
> >that they are sufficiently sensitive to add the equivalent of an extra
> >stage of audio amplification to a detector set.
>
> Wow, wish I could get my hands on a pair of those! I have two sets of Trimms
> but don't know how they rate, sensitivity-wise, with any others as I have
> nothing to compare them to.

Trimms are good, and about average for the usual 2000 ohm style fones.
I like Brandes (any of the series is good -- Navy, Admiral, Superior)
probably second, and the WECO fones third, and then things like Red Ball
and the like are pretty good, with the generic Trimms next, and those horrid
plastic things from overseas, last. Trimms are a bit slight on magnets,
but they still are good, and the featherweight ones pretty good too.
The generic WWII surplus things are fair to good. Some of them were
quite good, but there is a lot of variation in them (production differences
maybe?). Generally, the bigger the diaphram, the heavier the magnets,
the better the tin cans. Interestingly, one of the best things I have
used are those huge Type 19 set tin cans from WWII. They have huge
diaphrams and big magnets, but are ugly as sin, and heavy enough to
give bad cases of chops cauliflower ear. Also, they have very wierd
(typically Brit?) connectors that usually are cut off and rewired by
the time I find them. Those 19 set things, the Brandes, and the
Baldwins are all great for CW use. Most others I find lesser to average,
or fair to mittlin' as the cotton folks say. But, those are my preferences
and, like underwear, everyone has their pet pair.

Bob/NA4G

Date: Thu, 22 May 1997 14:03:53 EDT
From: km1h@juno.com
Subject: km1h: Re: FW: 6146 Transmitter

Woops, sent to wrong adr yesterday.

- --------- Begin forwarded message ----------
From: km1h
To: glowbugs@www.atl.com
Subject: Re: FW: 6146 Transmitter
Date: Wed, 21 May 1997 20:08:56 PST
Message-ID: <19970521.201228.8951.14.km1h@juno.com>
References: <49209B3201E40200@smtp.pennwell.com>

Another cheap way to neutralize many amps is to first adjust any properly
spaced variable cap for minimum feedthru with the screen voltage

disconnected. A RF probe into a VTVM or DVM works fine.

Then measure the cap value (any homebrewer should have a LC meter...right?) and replace it with a piece of coax trimmed to value. For a 6146, etc you can use any of the common Teflon mini coaxes such as RG-178, 179, etc. The cable impedance is irrelevent. Many times only an inch or so is required.

The downside to this is that a replacement tube might require you to repeat the process...but it saves using a sometimes hard to find cap with sufficient voltage ratings and then having to fabricate an insulated mount.

I have used the above method with larger TX tubes such as the 813, 4-250 and 4-1000A over the years....just use coax with adequate voltage ratings.

A great LC meter for glowbug use is the Tektronix 130. Measures L&C up to 300pf or 300uh and the lowest scale is 0-3 C or L (0-3; 0-10; 0-30; 0-100 and 0-300 scales). All tubes and shows up real cheap. I just picked up my 3rd one last weekend at Rochester, NH swap meet....cost $5. About 1 hour replacing the "Black Beauty" caps and the accuracy is within a hair of a HP 4271B digital kilobuck job. This is a real compact , for a BA, unit and has a great 6" meter.

73...Carl KM1H
- --------- End forwarded message ----------

Date: Thu, 22 May 1997 11:34:21 -0700 (MST)
From: Jeff Duntemann <jeffd@coriolis.com>
Subject: New Visio version 2/3/4 tube & PC patterns

Hi gang--

I just posted a new archive of Visio art to my FTP site:

ftp://ftp.coriolis.com/pub/Shareware/vistube.zip

(Don't forget that "Shareware" is capitalized!) The file is 572K in size. It's freeware; pass it around, link to it, and most of all USE it.

The archive contains three Visio stencils with separate versions for Visio V2, V3, and V4. The three stencils are these:

TUBES -- These are completely original schematic diagrams of all common tube types, some in several variations. I also include loose elements like grids, cathodes, etc. so you can make up your own if you need to.

PCPADS -- These are PC patterns for PC layout. Much of it is solid-state oriented, obviously, and there are pads for ICs, transistors, and some SMT formats. But I also made up pads for three different PC tube socket types: 7 pin min, 9 pin min, and 12-pin Compactron. I have a Novar socket that I have not yet drawn, but will in time. (Several people have told me putting octals on PC boards is a bad idea, as they hang onto their sockets too tightly, and yanking the tube can rip the socket right out of the board. So there's no octal pattern.)

COMPLACE -- This is a "component placement" stencil that includes scale drawings of various components, so you can drop a component on a PC layout to check the spacing. Resistors, caps, transistors, toroids, inductors, Arco trimmers, etc.

Visio is a VERY good draw program, especially for people like me with no inherent art sense. It emphasizes clip art from "stencils" that you drag to a drawing and drop in place. Some of the clipart is "smart" in that it only stretches in one dimension, or flips intelligently, and so on. Hard to describe, but it's brilliant. I use it for EVERYTHING in terms of technical illustration, including schematics and PC art.

The Visio Technical version of the product is the one with all the other schematic symbols. (All I've done are tubes.) Unless you're willing to draw up your own resistor and capacitor symbols and all, you have to have Technical.

Anyway. VISTUBE.ZIP is now up there if you want it.

- --73--

- --Jeff Duntemann KG7JF
  Scottsdale, Arizona

Date: Thu, 22 May 1997 11:44:13 -0700 (MST)
From: Jeff Duntemann <jeffd@coriolis.com>
Subject: Re: Playing with a modern spark tuner --- suprising funzies

At 01:08 PM 5/22/97 -0400, you wrote:
>>> I also found
>>> that a small capacitor across the detector improved the volume by a
>noticable
>>> amount.
>
>>This is interesting. I have never seen that trick. Perhaps I will have
>>to go back and try it tonight. I dunno what this could be doing, unless
>>it is giving a measure of negative resistance to overcome losses in the
>>crystal by feeding some AC voltage over to the headphones (a few percent).

I have often wondered if a tiny bit of tightly controllable forward DC bias across the detector diode would reduce the barrier region and make it more sensitive. (I actually was able to copy WJJD in Chicago through a silicon rectifier diode with a .6v barrier, but then we were two miles from it and looking right down the array's 50,000 watt throat...)

- --73--

- --Jeff Duntemann KG7JF
  Scottsdale, Arizona

Date: Thu, 22 May 1997 14:30:50 -0500
From: "Robert M. Bratcher Jr." <bratcher@worldnet.att.net>

Subject: Re: High power xtal osc rigs

At 03:47 PM 5/21/97 +0000, Brian Carling (Radio G3XLQ / AF4K) wrote:
>On 20 May 97 at 19:10, Dave spoke about Re: High power xtal osc rigs
>and said:
>> Bob,
>>
>> I have a rock in an aluminum holder almost the size of my hand
>> labeled "740.000 KC". Ya 'spose that might work? Oh - wrong band!
>
>Dave, you play a few records and amuse the neighbours though!
>How about an 813 oscillator modulated by a pair of 811As ??
>
>THAT would get their attention!

Here in Houston that would interfere with local 50KW KTRH.
Don't think the neighbors would be very happy about that!

Robert M. Bratcher Jr.
E-mail to:
bratcher@worldnet.att.net
Record collector, 8mm, super 8, 16 and 35mm Film collector.
Looking for prerecorded reel to reel tape albums.
I like old radio's too.
Collins, Hallicrafters, National & Hammurland are my Favorites!

Date: Thu, 22 May 1997 15:20:02 -0600
From: mack@mails.imed.com (Ray Mack)
Subject: Re: Heterodyne receiver tricks - continued

<snip>
 Move over kenicoyasawhooies (that be them thar late model thingies wat
don't glow no more)!

Bob/NA4G

- --

Bob:
        I don't know what you are doing wrong. I've gotten them to
glow a time or 2 :<)

Ray Mack
WD5IFS

Date: Thu, 22 May 1997 15:28:39 -0500 (CDT)
From: Dave <gekko95@ix.netcom.com>
Subject: Re: High power xtal osc rigs

At 02:30 PM 5/22/97 -0500, you wrote:
>At 03:47 PM 5/21/97 +0000, Brian Carling (Radio G3XLQ / AF4K) wrote:
>>On 20 May 97 at 19:10, Dave spoke about Re: High power xtal osc rigs
>>and said:

>>> Bob,
>>>
>>> I have a rock in an aluminum holder almost the size of my hand
>>> labeled "740.000 KC". Ya 'spose that might work? Oh - wrong band!
>>
>>Dave, you play a few records and amuse the neighbours though!
>>How about an 813 oscillator modulated by a pair of 811As ??

Actually, I more had in mind A2 emmission - confuse 'em and make
'em think it's Independancd day!

Dave WB7AWK

****

        After days of dreaming up new twists on the
        35EH5, one of God's helpers said "Hey, this
        tube thing is cool and all. But can we
        get on to something else? We've got bugs
                and stuff to make"

****

Date: Thu, 22 May 1997 18:11:58 -0400 (EDT)
From: leeboo@ct.net (Leon Wiltsey)
Subject: sale of cheap tubes

>To: ba
>From: leeboo@ct.net (Leon Wiltsey)
>Subject: sale of cheap tubes
>Cc:
>Bcc:
>X-Attachments:
>
>>Date: Wed, 21 May 1997 22:56:13 -0400 (EDT)
>>Reply-To: leeboo@CT.NET
>>Sender: owner-boatanchors@sco.theporch.com
>>From: leeboo@CT.NET (Leon Wiltsey)
>>To: BOATANCHORS@sco.theporch.com
>>Subject: sale of cheap tubes
>>X-Sender: leeboo@ct.net
>>X-Listprocessor-Version: 8.1 -- ListProcessor(tm) by CREN
>>
>>>To: Gb
>>>From: leeboo@ct.net (Leon Wiltsey)
>>>Subject: sale of cheap tubes
>>>Cc:
>>>Bcc:
>>>X-Attachments:
>>>

>>>Hi gang
>>>
>>>I receintly posted a message telling you all I had discovered a quantity of
>>new tubes.
>>>the owner will sell them for 1993 list, they are all new in boxes. I made
>>the mistake
>>>of telling him I would run an inventory of his stock, He agreed. When the
>>time came to
>>>start he brought out 7 tube caddied of tubes, plus he has a 9 foot wall
>>with 3 shelves full.
>>>So far the I have inventoried many hundreds of tubes and not near done. Am
>>still bringing
>>> home tube caddies full to inventory. YES THERE ARE SOME 1VOLT TUBES IN HIS
>>STOCK.
>>>when I get thru I will post a message. As I said he only wants 1993 prices
>>and on some
>>> even less. I should be thru by the end of the week. I am saving all the
>>inquities I received
>>>and will answer them as soon as I have the inventory completed and a copy
>>of his price
>>>list.
>>>
>>
>> I SUB TO BOTH GLOWBUGS & BOATABCHORS
>>
>>68 yr old semidisabled senior
>>(stroke got my balance & hand to eye coordination)
>>old old old ham but I'm back agn
>>now KF4RCL TECK+ (MUCH HAPPINESS)
>>PLAY KEYBOARD AND SING?
>>BUILD MOST OF MY STATION EQUIP
>>(tubes that is no SOLID STATE)
>>
>>no trash music (anything composed after 1965)
>>
>>
>>
>>Leon B Wiltsey (Lee)
>>4600 Lake Haven BLVD.
>>Sebring, Fl. 33872
>>
>>SEBRING FL. THAT WONDERFUL PLACE WHERE THERE IS NO QRM
>>FROM ANYTHING LOCAL
>>
>>
>>
>

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(stroke got my balance & hand to eye coordination)
  ham agn as KF4RCL TECK+ (MUCH HAPPINESS)
BUILD MOST OF MY STATION EQUIP
(tubes that is no SOLID STATE)

Leon B Wiltsey (Lee)
4600 Lake Haven BLVD.
Sebring, Fl. 33872

SEBRING FL. THAT WONDERFUL PLACE WHERE THERE IS NO QRM
FROM ANYTHING LOCAL

Date: Thu, 22 May 1997 18:29:29 -0400 (EDT)
From: rdkeys@csemail.cropsci.ncsu.edu
Subject: Re: Heterodyne receiver tricks - continued

>
> <snip>
> Move over kenicoyasawhooies (that be them thar late model thingies wat
> don't glow no more)!
> Bob/NA4G
> ---
> Bob:
>   I don't know what you are doing wrong. I've gotten them to
> glow a time or 2 :<)
> Ray Mack
> WD5IFS

I must be doing something wrong, because they glow for a shorter time
than Chinese 811's, and they are not noted for glowing long......

I know, I must have let the smoke outta them thar deadbugthingies, one
time or another. That's it! I need to refill their smoking lamps an'
make sures they be lit! .....(:+}}.....

Bob/NA4G

Date: Thu, 22 May 1997 18:44:40 -0400 (EDT)
From: rdkeys@csemail.cropsci.ncsu.edu
Subject: Re: High power xtal osc rigs

> Actually, I more had in mind A2 emmission - confuse 'em and make
> 'em think it's Independancd day!
>
> Dave WB7AWK

Well, a few percent A2 modulation makes for a nice signal. I just
wish a little A2 was acceptable down in the HF regions. It gives
a signal some character. Ol' VCS used to always come up with a few
percent modulation, or at least it sure did sound that way to me,
and you could spot it amidst the herd on the top of the hour, quite
easily. A few hams have run it on the ham bands over the years,
and it does have a nice mellow note. It might really confuse the
silisidebanders a bit. Or, how about checking into an AM net with
MCW.... nah, they would probably be the ones to know what it was.....
And, you can receive it on a xtal set! Mebbie down on 1666 meters
or such.....(:+}}..... Hows about a full-wave self-rectifying Hartley....

Dreamtime.....

Bob/NA4G

Date: Thu, 22 May 1997 19:09:48 +0000
From: "Brian Carling (Radio G3XLQ / AF4K)" <bry@mnsinc.com>
Subject: Larry Wollken

Does anyone know the correct e-mail address for
Larry Wollken ??

He lives in the Maryland / DC area and may be reading this, but I am
not sure where we met up on the Internet exactly and I wanted to
contact him again.

Thanks!

73 de AF4K / G3XLQ, Bry
```
**************************************************
*** 73 from Radio AF4K/G3XLQ Gaithersburg, MD USA  *
**  E-mail to:  bry@mnsinc.com                     *
*** See the interesting ham radio resources at:    *
**  http://www.mnsinc.com/bry/                     *
**************************************************
```

Date: Thu, 22 May 1997 17:07:37 -0600 (MDT)
From: Terry Dobler KJ7F <kj7f@micron.net>
Subject: Re: PCB Layout

Gang,

   Thanks for all the great replies to my posting.   Is this
a great group or what!   I've been swamped with other stuff
most of the week (my oldest son is graduating from Boise High
School tonight, yeah!) but hope to follow up on all the leads next
week.

Terry KJ7F

kj7f@micron.net (Boise, Idaho) http://netnow.micron.net/~kj7f

---

Date: Thu, 22 May 1997 16:37:19 -0700 (PDT)
From: JMcAulay <jmc@QNET.COM>
Subject: Re: Playing with a modern spark tuner --- suprising funzies

At 11:44 AM 5/22/97 -0700, you wrote:
>At 01:08 PM 5/22/97 -0400, you wrote:
>>>> I also found
>>>> that a small capacitor across the detector improved the volume by a
>>noticable
>>>> amount.
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>>>This is interesting.   I have never seen that trick. Perhaps I will have

>>>to go back and try it tonight. I dunno what this could be doing, unless
>>>it is giving a measure of negative resistance to overcome losses in the
>>>crystal by feeding some AC voltage over to the headphones (a few percent).
>
>I have often wondered if a tiny bit of tightly controllable forward DC bias
>across the detector diode would reduce the barrier region and make it more
>sensitive. (I actually was able to copy WJJD in Chicago through a silicon
>rectifier diode with a .6v barrier, but then we were two miles from it and
>looking right down the array's 50,000 watt throat...)

Yes, it will. Using a 1.5 volt source with a potentiometer/divider will work. Many years ago, I actually saw one commercially-made "crystal set" which used such a scheme. Can't remember the value of the pot, doggone it (or maybe never knew). 'Most anything high enough ought to do. Don't forget audio bypass around the biasing.

73
John WA6QPL

Date: Thu, 22 May 1997 18:48:29 -0700
From: "Paul Carreiro, N6EV" <carreiro@barepower.net>
Subject: Re: N2DAN/SK

At 09:59 PM 5/21/97 -0700, I wrote:

>P.S. Speaking of "Keys"... a sad note.. Steve Nurkiewicz, N2DAN, the
>creator of the famous Mercury CW key became a silent key a few nights ago
>from cancer. Ask anyone who has one of his keys.. they will say they are
>without a doubt the best available. (I'm not regreting postponing my order).
>"73 and ZUT OM"
>73 all.
>Paul N6EV

Thought I would clarify a mistype above... that should have read:
(I'm NOW regreting postponing my order)

I would really have loved to have one of Steve's keys in my collection.
(Anyone have one for sale?)

73 all.
Paul N6EV

  Paul F. Carreiro - N6EV - ex-N6HCS - El Camino Village, CA
  E-Mail: carreiro@barepower.net - http://www.barepower.net/~carreiro/
  QRP - Boatanchors - Glowbugs - Mobile CW - QRQ +40WPM - ZUT!
  NorCal QRP #367 - QRP QRCI #8885 - CW FISTS #1407 - QRP-L #236
  Zuni Loop Mountain Expeditionary Force (QRP Field Day)

Date: Fri, 23 May 1997 10:35:20 -0400 (EDT)
From: rdkeys@csemail.cropsci.ncsu.edu
Subject: Re: More Crystal Detector/Heterodyne/Almost Glowbug Historical Funzies

>
> Bob,
> Here is the excerpt from the article I have on crystal sets in regards to the
> capacitor across the detector:

Neat. All hands take note, and see if this works in your sets.

> "In Diagram (B) we have the same circuit with the addition of the small
> fixed condenser (K) connected across the crystal detector. This fixed
> condenser acts as a storage capacity for the waves and adds considerably to
> the volume, as it supplies an additional current to the crystal.. This
> addition has increased the audibility from 55 per cent to 85 per cent, the
> maximum value determined by the Bureau. The capacity of (K) depends upon

Bureau ---- probably Bureau of Standards Circular No. xxxx.

> the nature of the crystal detector, but in any event the capacity must be
> small to prevent by-passing much of the current across the dectector. With
> some detectors 0.00025 mf is about right, while with other types this may
> be as low as 0.0001 mf. or even less. A small three-plate variable
> condenser will often prove of value in getting the adjustment correctly."
>
> Not a real technical description but from practical experience I can attest
> to the fact that it does appear to work. I hope to do a bit of playing
> around with the circuit this weekend seeing as I've got three days. Seeing as
> how I have a wife, a set of 4 year old twin boys, two daughters aged 9 and
> 12, a dog, two birds, and a yard that's a mess after the winter, I'll be
> lucky to get anything done but I'll give it a shot. Maybe you'll do better at
> researching this.

I know the time slicing hassle.....(:+}}.....

Great, you and others try it and see what happens.

I tried it last night and did not get anything to improve. It actually
reduced signal on my set with a 1N34. Even as little as 50pf killed the
audio on a germanium diode. I was unable to test a galena or carborundum
detector.

What reference is that from. That sounds like the Bureau of Standards
articles back about 1920, from my foggy memories.

If so, they are using galena rather than the typical germanium diode I
am using. On galena (PbS, lead sulfide), the effect of the capacitor
may be there. On germanium, it did not seem to work. It might also
be worth trying on a carborundum detector, if anyone has one.

> I wish I knew where this article came from and who wrote it but I have no
> idea. It really is quite good. I also have about 9 drawings that go with it.
> I hate to make copies and spread it around without knowing who to give the
> credit to but if you're interested I think I can get it all in Postscript
> format and send it down to you attached to an email or just make a hard copy
> and send it.

I think that is those Bureau of Standards articles. They are public property
so you can make as many copies as you like. It was reprinted by John Irwin
in his book ``Radio'' in 1922. It may have been reprinted again later by
others. If I can find the original articles with complete citations, or
xeroxes of them, I will rekey them and add them to the Glowbug archives.

> One last interesting excerpt:
>
> "In Diagram (C) we have the same circuit as in Diagram (A), but a fixed
> condenser (K) is used to bypass radio frequency current around the phones.
> The average audibility under all conditions is reduced to 45 per cent;
> hence, this is not always an advisable addition. In many makes of phones
> there is a considerable amount of distributed capacity in the windings of
> the magnets and this frequently is sufficient to properly by-pass the radio
> frequency current around the inductance without the addition of external
> capacity. However, in case the phones have a high inductive value with
> little distributed capacity, a by-pass (K) may be necessary."

Actually, the audio capacitor across the headphones was used to produce an audio filter effect. You can test this out by trying a 0.01, 0.05, and 0.10 ufd cap across the headphones. It will reduce the audio passband so that close heterodynes are nil. The condenser is called the ``stopping'' condenser if my memory is correct this morining, although I might be confusing it with the bridging condenser (need to check the manuals for sure). It is covered in the SE 143/1220/1420 manuals. Its original purpose was to set the bandwidth for audio tuning for spark signals with a wide decrement, and not really for bypassing RF.

With weak crystals and poor headphones, it might make a difference to bypass the rf around the phones. I usually try it either way, and usually it makes no real difference for RF values of capacitance. On audio values of 0.05 to 1.0 ufd, it makes a big difference in the passband. I found 0.10ufd to be ideal for trimming the heterodyne off signals separated about 30kc. Last night I was able to hear Louisville from Raleigh (1000 miles?), quite well, but it took the filter condenser to trim a nearby heterodyne on close coupling.

> I always put a bypass cap on the phones, just tradition I guess. Maybe in all
> cases it's not such a good idea.

It does not matter much, until you get to the audio shaping mode.

> I get the feeling we could really optimize a crystal detector to go with the
> basic SE-143, 1220, 1420, etc. tuner-type box.

Yes, I was playing with my breadboard loose coupler again, last night, and got quite remarkable selectivity --- less than 5 degrees of arc edge to edge on a local station, using 12 inches of coupling with tuned primary and secondary coils. That was about twice the width of the dial pointer line. It blew my mind! Real Tuned Circuits == Real Selectivity! Too bad the kenicoyasawhooies don't use real tuned circuits anymore.

I had to use the Baldie Micas though because other tin cans were only good out to 6-8 inches of coupling before the signal strength fell off to a low value. I will followup with a tin can report in a bit.

> Let me know if you want a copy the the article and drawings.

If it is the original Bureau of Standards articles, yes, I would like a copy of that. If you can, blow it up by copying so that the drawings are about 6 inches across (to fill an 8.5 x 11 page column about 6 inches wide of text. I will add them to the archives. I have been looking for them for a while, but don't seem to be able to find them in our local library.

> PS: Wouldn't it be kinda neat to have some little local nets using crystal
> recievers and dinky little AM or CW transmitters?

Yes.... I do it sometimes with the locals using my baby regen and baby Hartley (a 6J5 in each) at about 36 volts on the plates. Works fine for about 2-3 miles out. I get maybe 100mw output. They are made on black acrylic sheet plastic, and are about 4 x 4 x 6 inches in size. You could take the Hartley, and use that as the heterodyne oscillator, and just key it to the antenna, using a backshunt key (SPDT key or relay) to switch the antenna between the xtal set and the Hartley. That was how arcs were done in the early days --- they ran continuously and were dumped between the antenna and the dummy load at a keying rate. When the antenna would be on the xtal set, the Hartley would provide the heterodyne. Sounds like a funzies Glowbug project.

73/ZUT DE NA4G/Bob UP

p.s. Odd thought.... If we call the tube sets ``glowbugs'', what do we call the xtal sets, tikker sets, electrolytic detector sets, etc? Something like ``dinobugs'' or ``pre-columbian glowbugs'' or ``pre-historic glowbugs'' or what????? (:+}}.....

..... I know.....``sparkiebugs''! (:+}}.....

Date: Fri, 23 May 1997 11:28:00 -0400 (EDT)
From: rdkeys@csemail.cropsci.ncsu.edu
Subject: Boatanchor Bob's Tin Can Report

Well, I stuck the tin cans where da choppers should go and bit da bullet, an' ran one o' them thar scientificus experimentalus thingies on da bench. After rounding up about 25 different pairs o' tin cans, an' selecting those that still worked, I ran some simple comparisons using a doubletuned loose coupler with coupling from 1/2 to 12 inches, and compared the various sets of tin cans against each other. For the test, the coupling was set to 3 inches, and a 10kw local was tuned in and peaked on both the primary and secondary circuits for maximum headphone volume, and the left there. Different sets of tin cans were tried and rated on a 4 point scale according to the following table:

Excellent	+3DB gain or more (highly sensitive and much better than average).
Good	+0-3DB gain (slightly better than average)
Average	0 DB gain (run of the mill volume from the xtal set)
Fair	-0-3DB gain (less or marginal sensitivity and sound reproduction.)
Poor	-3DB gain or less (low sensitivity and/or low clarity and reproduction, or tinniness of sound).

I am guessing at the relative sensitivities, but, using average as the set point, everything else was rated against that. If I could just

barely hear a difference, then it was in the good category. If it was markedly different it was in the excellent category. Without an AC microvoltmeter, I could not do much better than that.

Tin Can Rating	Headset Type
EXCELLENT	Nathaniel Baldwin Type C ``Mica Diaphrams'' (These were so much better than all the rest I can also attest to they being as ``sensitive as an extra audio stage''. The old Baldwin advertisements ARE true, after all.
GOOD	Brandes ``Admirals'' (These are very good sets.)
	Brandes ``Superior'' (These are also very good sets.)
	Red Seal (Don't know manufacturer, but they are very good.)
	Cannon No. 25 Alnico Magnetic (Very good also.)
	E.T. Ltd. CLR Type 19 Set (These are one manufacture of the British Type 19 set tin cans and are very good).
	Automatic Electric Co. (Very good, but I had never heard of this manufacturer, before --- very heavy receivers.)
	Trimm ``Dependable'' (Both pairs I have are very good, and have large heavy receivers compared to other Trimm sets below.)
AVERAGE	Telephonica Type TH-37 300Z (Military) (These are among the best of the military headsets.)
	Trimm ``Featherweight'' (4 pairs were all good and about the same, but light in construction and not as sensitive as the ``Dependable'' type sets. There are apparently several different series of these using about the same receivers but different bands and cables.)
	Western Electric 509W (1916 patent) (These were good but not as good as I had thought --- maybe my set was old or weak.)
	MPC MX-300-A 600 ohm AudioVisual headphones (These had good audio response and average sensitivity for plain modern cheap 600 ohm run of the mill headphones.)
FAIR	Cannon-Ball ``Empire'' (These were poorer than I had thought they would be for pre-WWII construction. Usable but not as good as others.)
	HX-30-U (Military tank headphones, WWII) (These fared suprisingly well, for military stuff. The sensitivity was usable, but the small size of the receivers made

reproduction quite ``tinny''.)

Type 19 Set unmarked manufacture (non-tin diaphrams)
(These were much poorer than the tin diaphram version
from E.T. Ltd., and would be marginally sensitive.)

Trimm Type B (These early Trimms were lousy and not
very sensitive. Perhaps my set is not that good, or
the design itself is marginal or maybe tuned for CW
work, perhaps. Sensitivity was marginal.)

POOR H-216/U (Standard Military 600 ohm phones) (These were
generally lousy, very tinny, and marginally sensitive.)

ANB-H-1 (Military headset, unknown manufacture) (Similar
to the H-216/U but different case shape. Generally lousy,
very tinny, and marginally sensitive.)

Murdock Type P-23 (Military) (Also generally lousy, very
tinny, and marginally sensitive.)

Murdock Type R-14 (Military) (Also generally lousy, very
tinny, and marginally sensitive.)

Note --- On the last three military sets, I don't have headset type numbers
for them, only the receiver numbers on the receiver cases. They are all the
generic WWII/Korean era military surplus headsets, common in the trade,
and I was suprised by the poor quality compared to the brand names.
I would expect the tinny response was tailoring of the sets to voice use
to some extent, and cheapness to other extents.

Note --- The better quality sets all had the larger sized headset receivers
with the larger magnets and diaphrams. That is telling one something, yes?

In my book, if you want the best, go Baldie Micas, or at least one of the
VERY GOOD category such as the Brandes lines or the Trimm ``Dependable''
line. The GOOD category is generally usable. Stay away from the rest.

Good Luck......

73/ZUT DE NA4G/Bob UP

End of glowbugs V1 #40
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AB4EL Ham Radio Homepage @ SunSITE

Created by **Steve Modena, AB4EL**